Storm Data and Verification Program Overview

NOAA's National Weather Service
Office of Climate, Water, and Weather Services
Verification Unit

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Presentation Outline

- Storm Data
  - What is Storm Data?
  - History of Storm Data
  - Storm Data Entry and the StormDat Software
  - Uses of Storm Data
  - Future of the Storm Data Program
- Verification
  - Program Overview
  - Matching of Events and Warnings
  - Verification Data
  - Products to be Verified in the Future

What is Storm Data?

- Storm data is the official collection of severe and unusual weather events.

- Event information contained in storm data is collected, quality controlled, and logged by forecasters at National Weather Service forecast offices (WFOs).

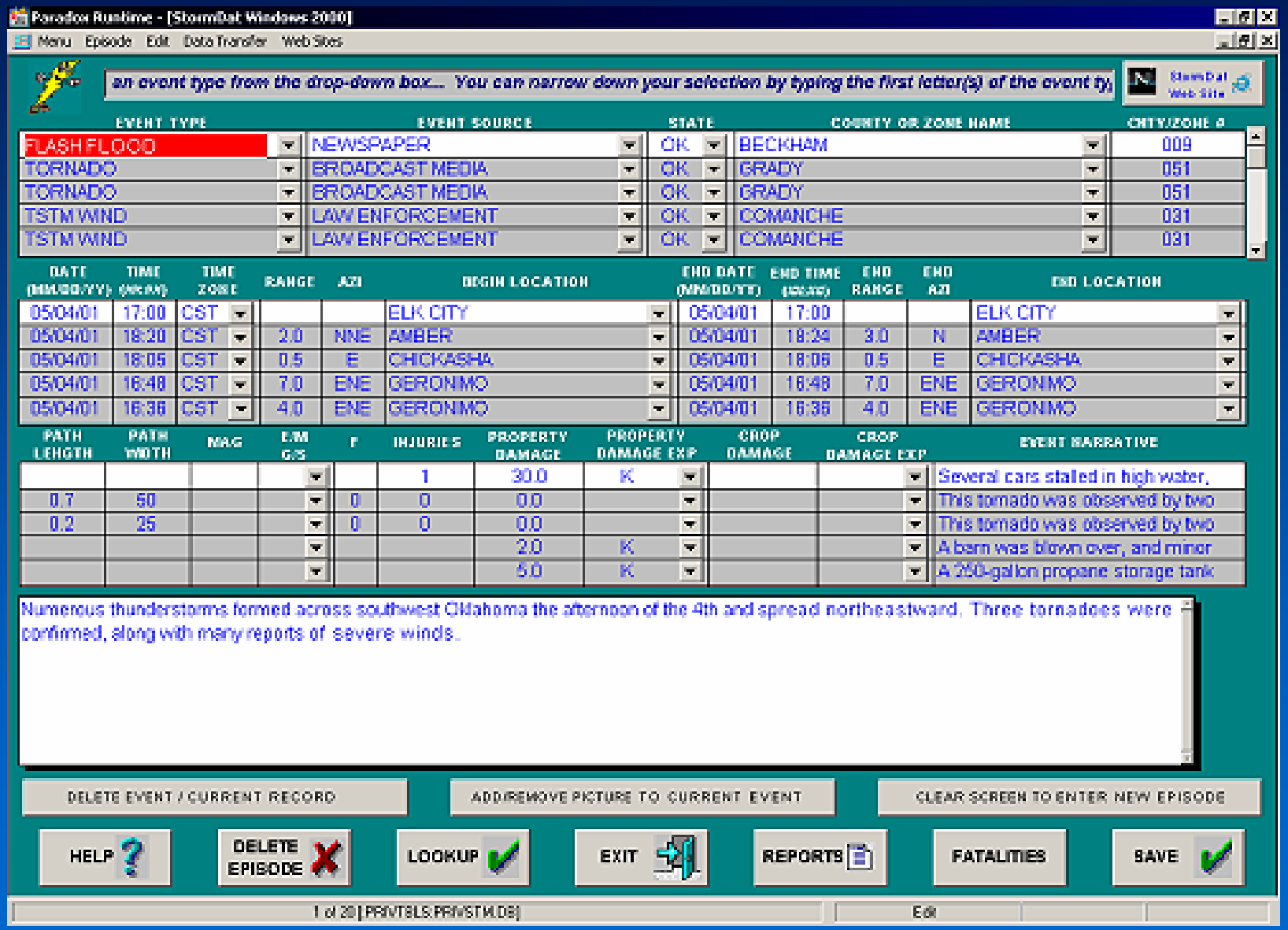
History of Storm Data

1850 – Earliest known storm data reports
– Data documented in memos by the military
1959 – First NCDC published *Storm Data* publication
– Data documented using typewriter
1993 – First electronic version of storm data collection
– Data documented using Corel WordPerfect 5.0 (DOS)
1996 – StormDat program created
– Data documented using Corel Paradox database software

Storm Data Entry and StormDat

- Each of the NWS's 123 WFOs is responsible for collecting events. They collect these reports from:
  - Official NWS storm surveys
  - Emergency managers
  - Official NWS observations
  - Amateur radio operators
  - Newspaper clippings / Media outlets
  - Other sources
- Events are logged using the StormDat program
- WFOs have up to 60 days from the end of a month to transmit storm data to NWS HQ

StormDat Program Screen Capture



Fields Collected by StormDat

- Event Type (ex. tornado, winter storm, flood)
- Beginning and Ending Time
- Beginning and Ending Location (state, county, location)
- Report Source
- Event Magnitude (ex. hail size, tornado f-scale, wind speed)
- Injuries and Deaths Associated w/Event
- Crop and Property Damage Estimates
- Narrative Description of Event

Quality Control Features

- Finite list of severe and unusual weather events
- The StormDat program has an extensive quality control check when events are saved
- The StormDat program also runs a database integrity check on startup
- Event tracking numbers are used so events may be amended and/or deleted from the database

Uses of Storm Data

- NCDC's *Storm Data* publication
- SPC's official severe weather database (tornado, hail, wind)
- NWS's short fused warning verification statistics
- NWS's internal service assessments
- Army Corps of Engineers
- Academic research studies
- Disaster reports
- Congressional and other government data requests
- Public data requests

NCDC's *Storm Data* Publication

JANUARY 2001
VOLUME 43
NUMBER 01

AND UNUSUAL WEATHER PHENOMENA
WITH LATE REPORTS AND CORRECTIONS

noaa NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL ENVIRONMENTAL SATELLITE, DATA AND INFORMATION SERVICE
NATIONAL CLIMATIC DATA CENTER
ASHEVILLE, NC

OUTSTANDING STORMS OF THE MONTH

1. Freezing Temperatures Reach Florida

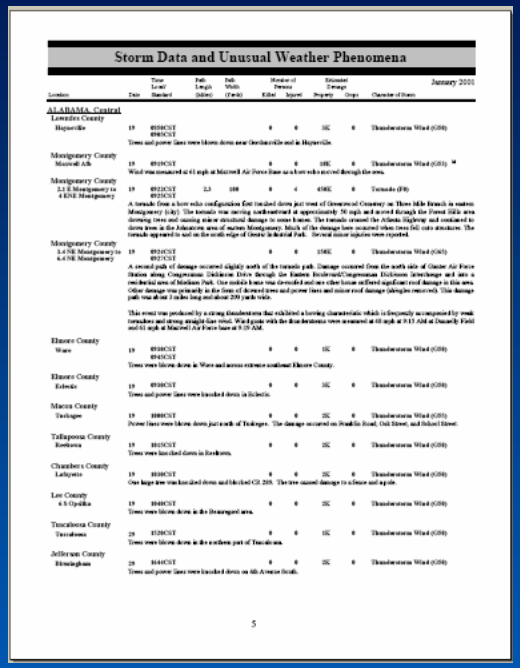
Following a cold frontal passage across the Florida peninsula on December 31, 2000, a large high pressure system moved from Canada southward toward the Southeast U.S. and northern Gulf of Mexico. The surface high pressure system brought widespread sub-freezing temperatures to Florida in early January 2001. Also affected were the West-Central and Southwest portions of the peninsula. Temperatures remained below freezing for six to nine hours. Many locations reported temperature minimums in the middle twenties. Early damage estimates were at nearly five million dollars over West-Central and Southwest Florida.

Left: Photo depicts a closeup of oranges encased in icicles shortly after sunrise on January1, 2001. The orange tree was next to a strawberry field being sprayed with water to protect the crop from sub-freezing temperatures. This photo was taken in Dover, Florida.

(Photographs courtesy of Fraser Hale, St. Petersburg Times Newspaper photographer.)

Right: Photo shows a common scene across the interior portions of Florida in early January as farmers try to protect their crops.

NCDC's *Storm Data* Publication


Storm Data and Unusual Weather Phenomena

January 2001

If you are interested in purchasing a subscription to the NCDC's Storm Data publication, please contact Stuart Hinson via e-mail at: Stuart.Hinson@noaa.gov

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Number of Persons Injured	Estimated Damage Property	Estimated Damage Crops	Character of Storm
ALABAMA, Central									
Lowndes County									
Hayneville	19	0850CST 0905CST			0	0	3K	0	**Thunderstorm Wind (G50)**
Trees and power lines were blown down near Gordonsville and in Hayneville.									
Montgomery County									
Maxwell Afb	19	0919CST			0	0	10K	0	**Thunderstorm Wind (G53)** M
Wind was measured at 61 mph at Maxwell Air Force Base as a bow echo moved through the area.									
Montgomery County									
2.1 E Montgomery to	19	0922CST	2.3	100	0	4	450K	0	Tornado (F0)

Future of Storm Data

- Over the new couple years the NWS plans on upgrading the StormDat program

- Planned enhancements:
  - turn the software into a web based program
  - map based entry screen (GIS)
  - upgrade database to mySQL
  - enhanced report generation

- Planned release: Late 2006

Verification Program Overview

- The NWS uses select events in storm data for the purpose of it's short fused warning verification program

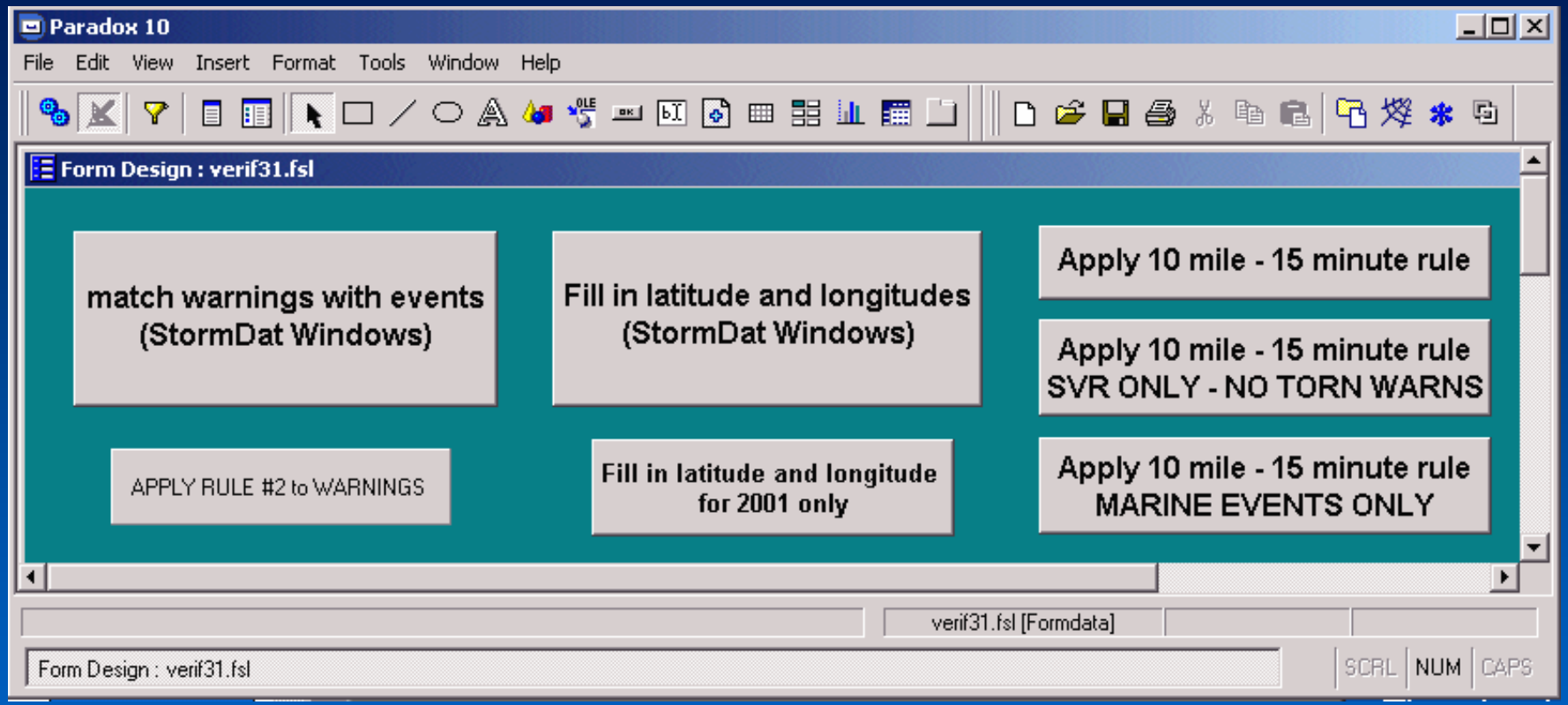
- Short fused warning products verified:
  - Severe Thunderstorm Warnings (SVR)
  - Tornado Warnings (TOR)
  - Flash Flood Warnings (FFW)
  - Special Marine Warning (SMW)

- Events are matched with warnings and scores such as probability of detection, false alarm ratio, and event lead time are generated

Events Used for Verification

- Severe Thunderstorm Verification
  - 50kt winds and greater
  - ¾ inch hail
- Tornado Verification
  - all tornado events
- Flash Flood Verification
  - all flash flood events (not flood)
- Special Marine Verification
  - 34kt winds and greater over marine waters
  - ¾ inch hail over marine waters
  - waterspout events

Matching of Events and Warnings



- Matching of events and warnings is done on the first business day of every month.
- The matching process takes approximately 5-7 hours

Sample Verification Report

NATIONAL WEATHER SERVICE
VERIFICATION / STORM DATA
VERIFICATION - SEVERE WEATHER - STATS ON DEMAND

NATIONAL WEATHER SERVICE SEVERE WEATHER STATISTICS

Period: 1/1/03 - 12/31/03

Summaries:

TORNADO WARNINGS ONLY

TORNADOS ONLY

Tornado warnings issued	:	4023
Tornado warnings verified	:	1014
Tornado warnings not verified	:	3009
False Alarm Rate (FAR)	:	.748

TORNADO EVENTS ONLY

TORNADOS ONLY

Tornado events	:	1531
Tornado events warned	:	1212
Tornado events unwarned	:	319
Average leadtime	:	13.5
Percent of events w/lead time > 0	:	71.7
Probability of Detection (POD)	:	.792
Critical Success Index (CSI)	:	.236

Sample Verification Report

NATIONAL WEATHER SERVICE
VERIFICATION / STORM DATA
VERIFICATION - SEVERE WEATHER - STATS ON DEMAND

NATIONAL WEATHER SERVICE SEVERE WEATHER STATISTICS

Period: 1/1/02 - 9/13/04
Counties: PRINCE GEORGE'S(MD) - MONTGOMERY(MD)

Severe Local Storms Verification Report for : LWX - BALTIMORE/WASHINGTON, VA

TORNADO WARNINGS ONLY

YR	MTH	DAY	ISSUE TIME	EXPIRE TIME	COUNTY	STATE	TYPE BASIS	VERIFICATION
2002	4	28	1702	1745	PRINCE GEORGE'S	MD	TORN-RAD	NOT VERIFIED
2002	5	13	1311	1345	MONTGOMERY	MD	TORN-PUB	NOT VERIFIED
2003	11	5	1421	1500	MONTGOMERY	MD	TORN-RAD	TORNADO
2004	5	25	1828	1930	PRINCE GEORGE'S	MD	TORN-RAD	NOT VERIFIED

TORNADO EVENTS ONLY

YR	MTH	DAY	TIME	COUNTY	STATE	EVENT	WARN TIME	WARN TYPE	LEADTIME
2003	11	5	1408	MONTGOMERY	MD	TORNADO		NOT VERIFIED	0
2003	11	5	1410	MONTGOMERY	MD	TORNADO	1421	TORN-RAD	0

Future of Verification

The NWS plans on creating verification statistics for the following products in the near future:

- Winter Storm Warnings and Watches
- High Wind Warnings and Watches
- Flood Warnings
- Coastal Flood Warnings

We will be using events logged in storm data for the purpose of verifying observations

Storm Data Program Overview

Contact Information

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